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(54) **Verge capping:guttering**

(57) A profiled verge-capping member, wherein one arm 21 forms a flashing designed to extend over the roof covering 10 and be retained there, the connecting member 20 forms a fascia to cover the vertical roof edge and the other arm returns under the edge to be fixed to the barge ladder or brickwork, e.g. at 24. A further profile member which forms a roof-line gutter for a building is bent from a sheet material in which the slope or fall of the gutter is provided by bending a mounting part of said sheet material at a slight acute angle to a gutter part of said sheet. A gutter channel has an outflow connector which when mounted on a roof-line exits substantially horizontally from the rear of the gutter. Further, a profile member adapted to form retention means for a gutter along the lower edge of the sloping roof of a building, comprises a strip-like member having a cross-section in two parts, a first part which is to extend along the lower parts of the sloping rafters, forming an abutment rising above the plane of those rafters, and a second part integral with the first which forms a cap over the lowermost ends of said rafters and spaces a gutter from said ends.

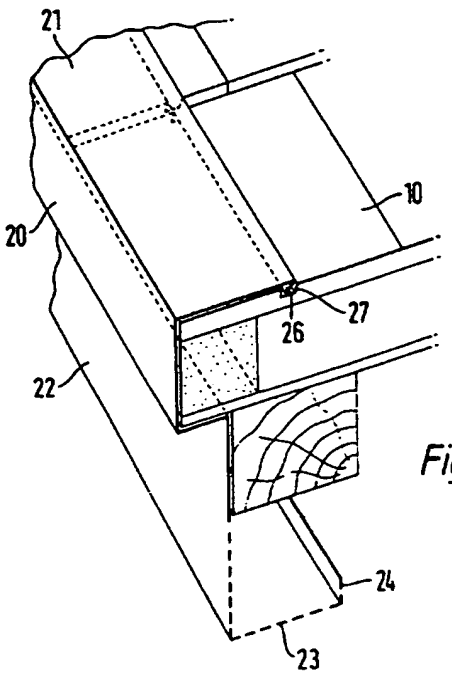

Fig.3

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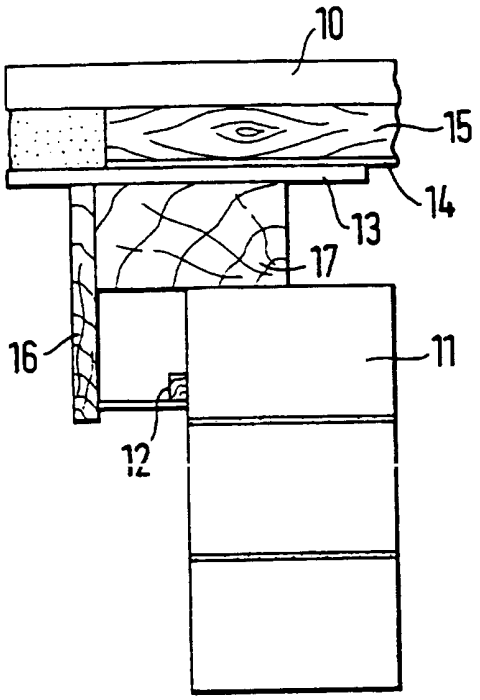

Fig. 1

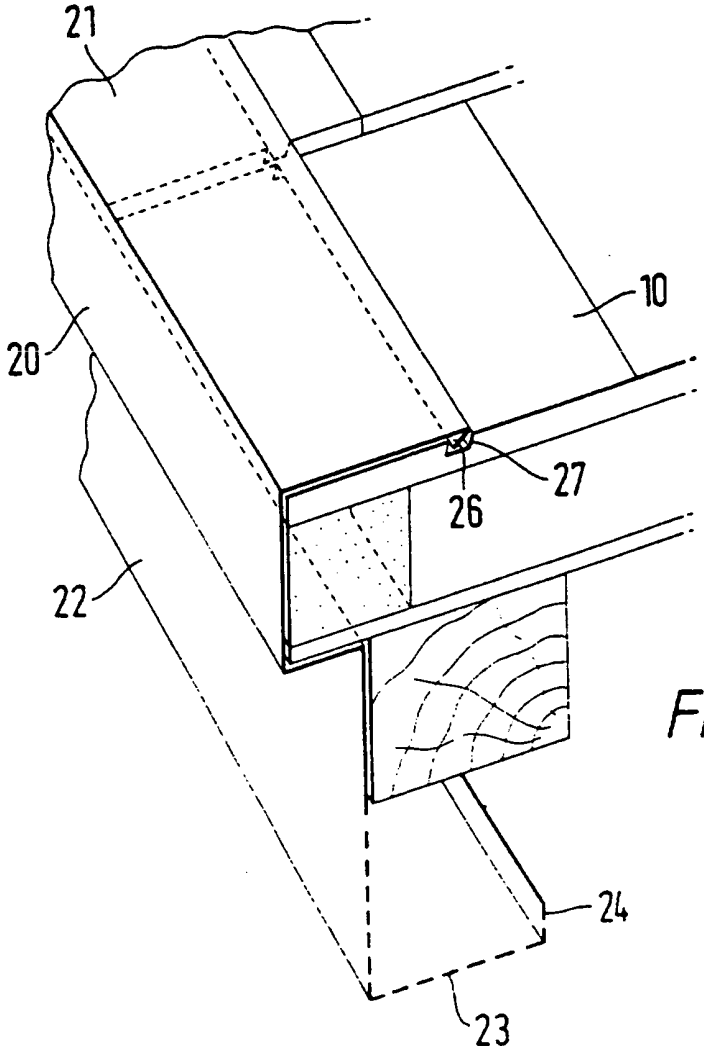

Fig. 3

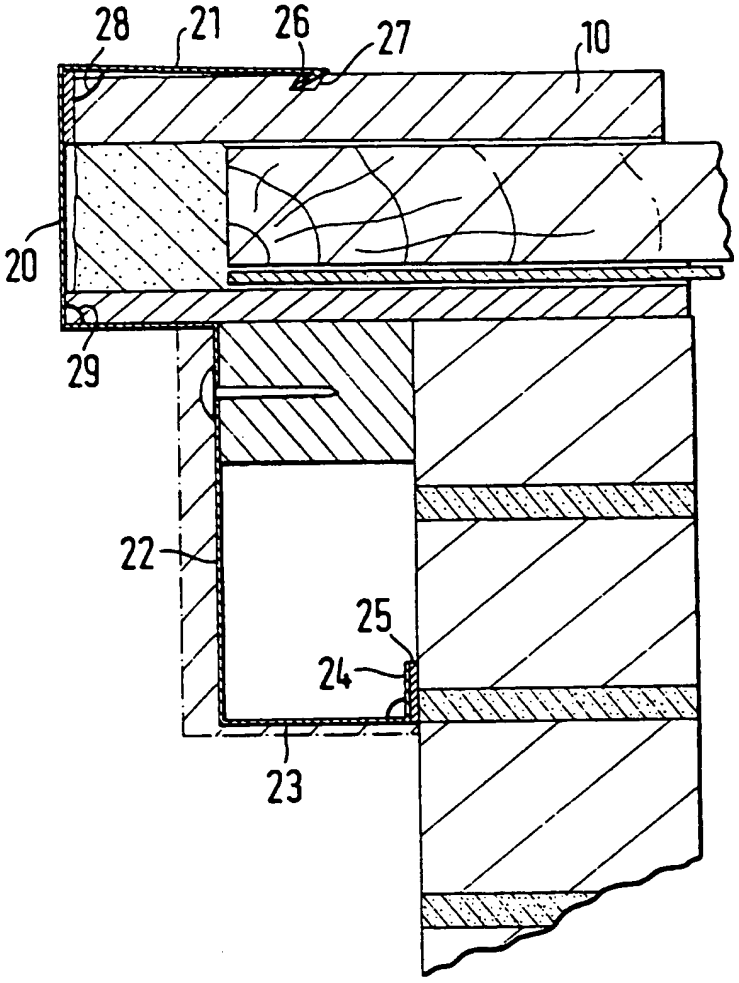

Fig. 2

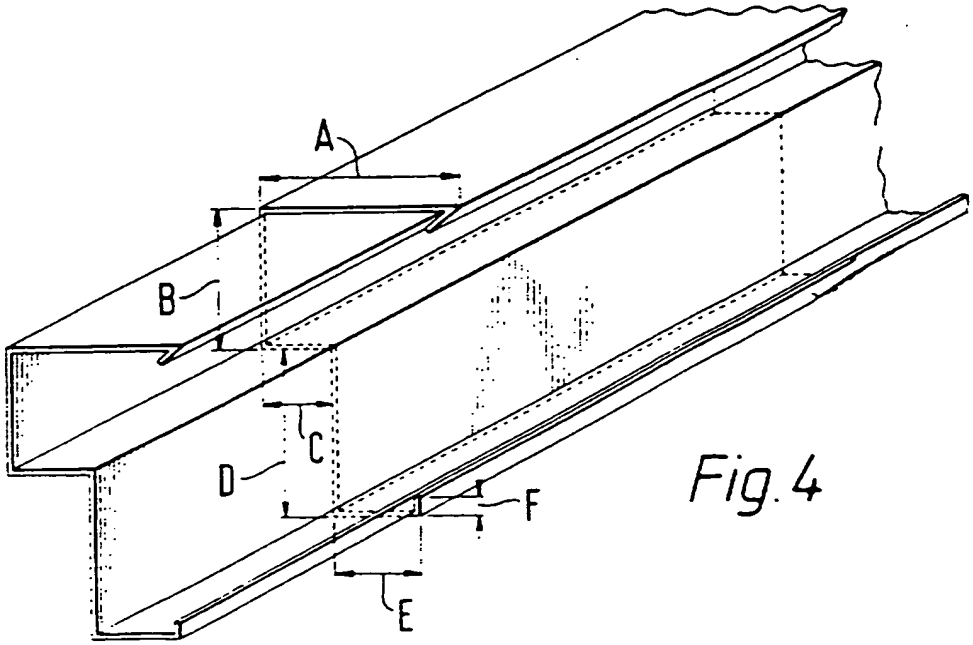

Fig. 4

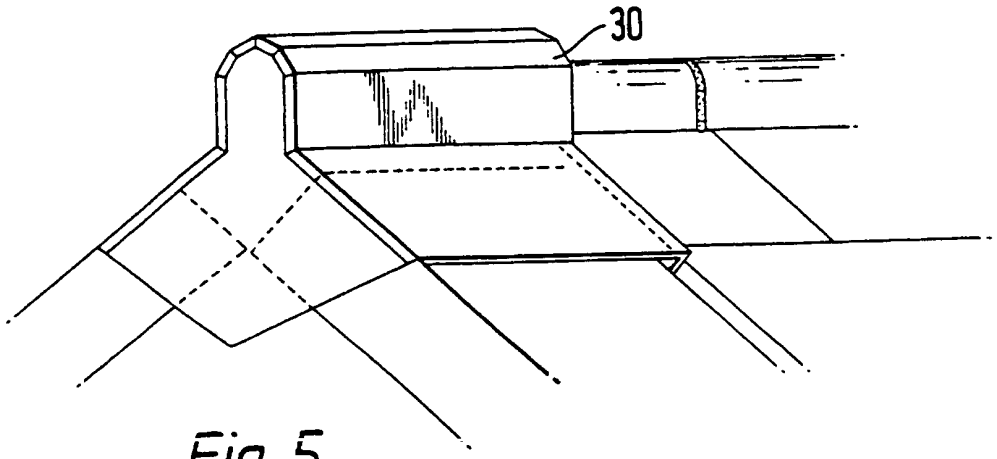

Fig. 5

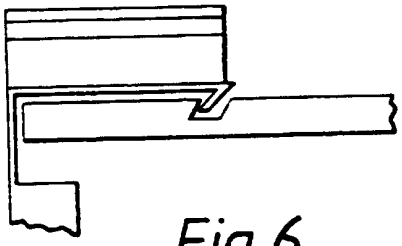

Fig. 6

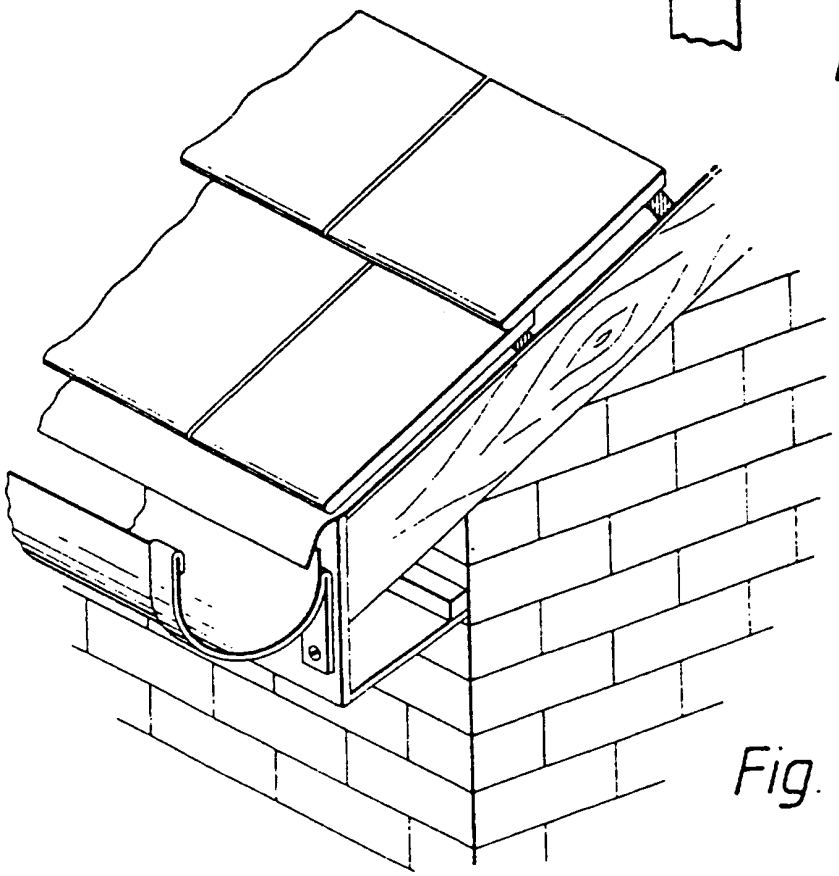

Fig. 7

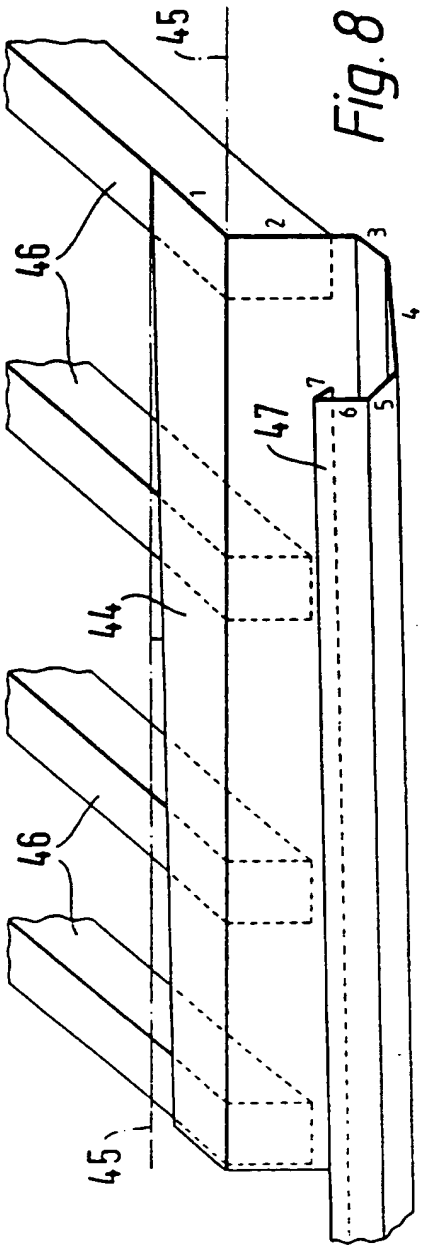

Fig. 8

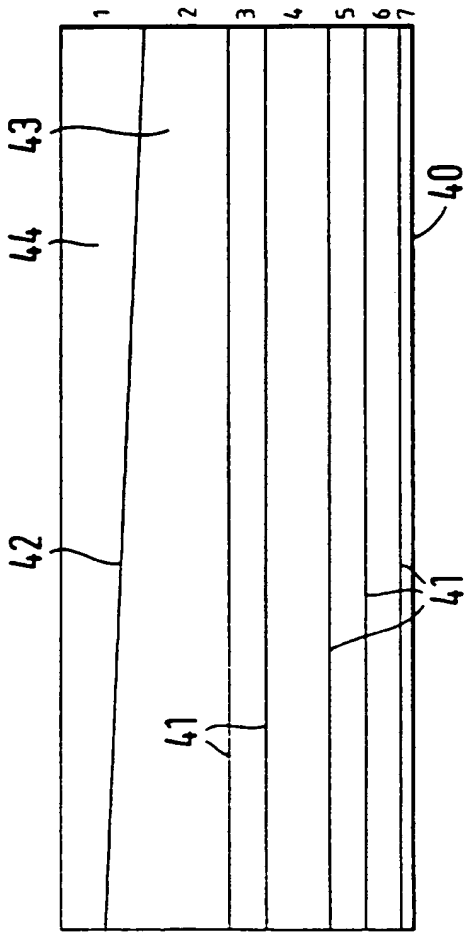

Fig. 9

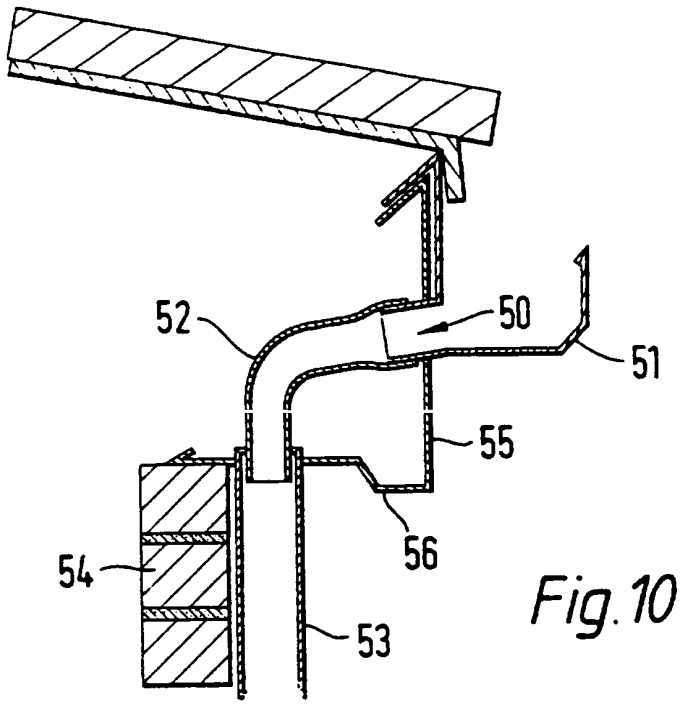

Fig. 10

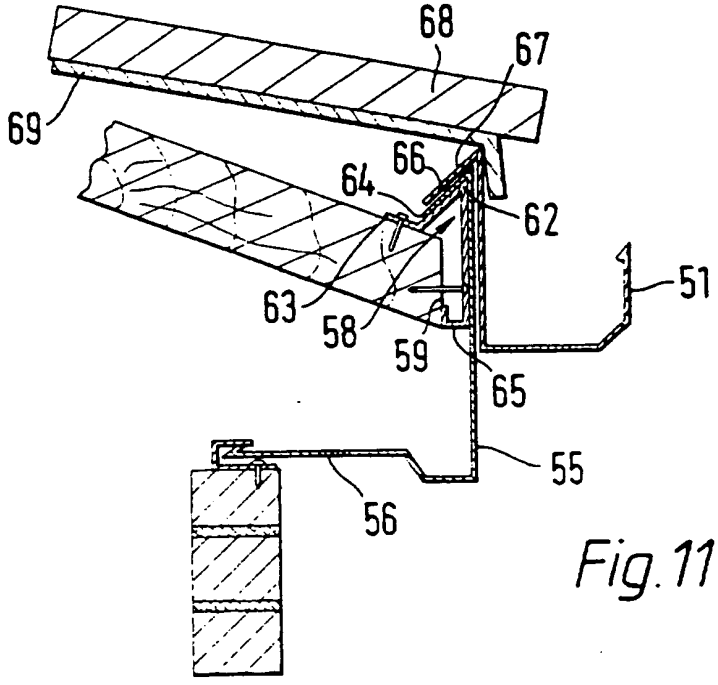

Fig. 11

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ROOF-LINE WEATHER PROTECTION SYSTEM

This invention relates to pre-fabricated roof-line weather protection systems which give ease of installation, added protection from the deteriorating effect of weathering on buildings and gives a fixed constant angle of fall on its rainwater gulleys. With this invention the design of the existing roof line structure is utilised to provide structural stability to the pre-fabricated profiles.

It is part of the construction design of many buildings particularly, but not exclusively, on domestic properties that the roof structure consists of a sloping timber framework with a waterproof covering often in the form of a tile, slate or similar fabric laid in horizontal rows with each row overlapping so that the water can run off it.

Protection at the edges or roof-line of the timber roof structure from the elements is conventionally provided by vertical timber boards, often referred to as fascias. A box structure is created around the exposed ends of the roof trusses by the addition of a horizontal timber or asbestos sheet, often referred to as a soffit.

A trough or gutter supported by gutter support clips fixed to the fascia, is provided at the lower edge of the sloping roof. The gutter is suspended at an incline to cause flow of the rainwater, depositing it into vertical pipes flowing into drainage systems or lower surfaces.

The arrangements presently made for weather protection of the timbers at the roof-line of buildings is currently in various ways unsatisfactory, and is time consuming and expensive to install.

The invention therefore aims to provide an improved system for this purpose.

The invention proposes a profiled member adapted for sealing a roof gable and which is of integral generally U-section comprising two arms and a connecting member, wherein one arm forms a flashing designed to extend over the roof covering and be retained there, the connecting member forms a fascia to cover the vertical roof edge and the other arm returns under the edge to be fixed to the barge ladder or brickwork.

In further developments, the invention provides profile members as defined in any of claims 8, 15 and 17.

The invention from another aspect concerns a roof construction embodying such profile members.

In order that the invention shall be clearly understood, various exemplary embodiments thereof will now be described with reference to the accompanying drawings, in which:

Fig.1 shows a conventional construction seen in section of a domestic roof construction at a gable end;

Fig.2 shows a similar construction according to the invention;

Fig.3 shows a perspective view of the construction in Fig.2;

Fig.4 shows the telescopic construction of profiled members according to the invention;

Fig.5 shows a perspective view of a ridge cowl for a gable end;

Fig.6 shows a side view of Fig.5;

Fig.7 shows the conventional gutter arrangement in perspective at a corner of a gable end;

Fig.8 shows a gutter arrangement according to the invention;
Fig.9 shows a strip of sheet metal with bending lines for producing the arrangement of Fig.8;

Fig.10 shows a section of a different gutter design with integral water outflow; and

Fig.11 shows a gutter and fascia support system.

Turning now to Fig.1, on the gable end of a building where the rows of tiles 10 end, a common construction is to lay brick 11 to form the triangular shape of the roof pitch and in order to create a straight edge a length of wood 12 is fixed to the outer brickwork. Asbestos in tile form 13 provides a fire stop and a base for a felt cover 14 to which batten supports 15 are fixed. Tiles are then fixed to the battens. A staggered recess is created by the overlaid tiles and this is usually filled by a cement mix (mortar). A vertical board (barge board) 16 is then fixed to the face of the barge ladder 17.

As seen in Figs. 2 and 3, this invention provides a pre-fabricated consolidation of all standard roof line protection components; the design of the individual buildings will determine how many of the main components are used. These components include barge board, soffit, fascia, mortar verge protection, venting system and gable ridge tile cowl. The whole system is manufactured from a current established and proven material which is commonly used in commercial buildings, such as Colour Coat HP200 high performance Plas-

tisol which is a steel galvanite with weather protective coating. This examplary material is produced by British Steel, but other materials might be used. The profile has a verge protection profile 20, a flashing 21, a barge board 22 and soffit 23. The latter has a sealing rib 24 which is sealed to the brickwork with a mastic 25. Alternatively, rib 24 may extend downwards and be screwed in place.

The gable mortar tile verge protection profile has a nib or lip 26 that locates into a groove 27 formed into the existing roof tiles 10. The groove can be preformed or formed on site regardless of the construction of the roof covering.

As seen in Fig.4, second or third additional lengths to complete the span are manufactured smaller than each other which allows it to form a telescopic joint. The telescopic joint within the system allows the whole unit to be prefabricated to fit correctly on the ends, where the gable angle meets the front and back face of the building. When on site, the telescopic movement of the system absorbs any variation in the shape of the construction of the building without having to trim to size. The telescopic lengths form an overlap when finally in place giving added strength at that point and if required a joint sealant could be added.

In buildings using current materials and building designs the gable end mortar joint requires regular re-pointing or replacing. This recurring problem is due to high winds, general movement of the structure, water ingress and frost which cause cracks. Cracked mortar also allows penetration of rain causing the edges of battens to quickly become soaked. Wet rot could then spread infecting the whole of the roof structure. It also exposes barge ladder and barge board to water ingress and thus rot. The asbestos

tiles also absorb water and constant soaking creates flaking. Overhanging purlins are also in danger of rotting. Internal damage can be caused by this problem due to water ingress. The profile member according to the invention helps substantially to avoid these problems.

The gable mortar tile verge protection profile lip 26 locates in the tile groove with a preferred angle of 45° and creates a simple effective clip for fixing. This also applies to the complementary ridge cowl unit 30 by the use of a corresponding angle which further forms a clamp for the end ridge tile as well as a weather protection. This is illustrated in Figs. 5 and 6. The cowl fits over the top of the profile members which meet at the ridge.

The depth and length of the required fixing groove 27 varies across each tile, based on the thickness of the roof covering and the angle of the pitch. The groove can be produced in the production process of a new roof covering or cut into an existing roof using an appropriate tool. The shape of the groove is determined by the cutter or tool used but it must be angled in such a manner that it can be utilised successfully as an anchor and receptacle for the locating lip 26. The distance between the located lip or nib to the inside face of the roof tile cap end must be pre-determined accurately to ensure the gap between the edge of the roof tile and the inside of the cap end allows for an effective seal that must be continuous from the ridge to the gutter. The angle 28 is variable, but it is preferable that this angle be between 80° and 85° allowing for the compression to be suitable to clamp the tile mortar bed and base and therefore maintain rigidity of the unit and a consistent end seal.

Angle 29 is preferably smaller than 90° allowing a gap

to occur in the corner on a fall which will account for and allow any form of water seepage to be carried down the pitch and carried into the rainwater system. If required solely as an effective weather guard system for the gable roof mortar bed the profile would be fabricated and cut with enough depth on the barge board drop to allow a fixing into the barge ladder but can be varied to allow fixing onto the existing barge board if there is no requirement for the barge board to be replaced. When both angles 28, 29 are less than 90°, the unit acts like a spring clip over the barge end.

Protection covers in various forms have been known and are fitted to many properties where storm damage has been frequent. This invention improves all of these known systems by stopping driven rain seeping over the edge of the tile and into the mortar bed, asbestolux, roof felt or batten which creates deterioration of the roof. The tile groove within the invention further acts as a gully that assists the carrying water into the rainwater drainage system. Dependent on the length and depth of the tile groove, it gives a varying percentage of protection from driven rain along its length. If required a seal can be incorporated In the tile groove. The tile groove could be set at any distance possibly utilising the end edge of the first tile as a guide for the creation of the groove.

Because of the effectiveness of the protection provided by the invention from the point of installation and once ascertaining advanced deterioration has not occurred to the mortar bed and battens, the existing mortar can be left intact and small cracks may be sealed or bonded as opposed to scraping out and removal, which is an added benefit over other existing systems. Installation of the new profile member removes the on-going requirement to renew this mortar bed.

The return leg 24 locates against the existing gable brickwork and could if required be intermittently sealed with a silicone mastic giving an invisible fix but allowing ventilation access to the barge ladder. The soffit face has no requirements for ventilation but it could be incorporated if required. The intermittent seal is seen as ample to regulate humidity levels in the barge ladder void. The shape of the barge board and soffit face can be varied by fabrication to accommodate individual design or aesthetic appeal. The invention removes the need for installation of individual fitments of soffit, fascia and end cap and the clamp created by the tile groove give a one-action snap on refit that protects the whole of the gable roof line. Further fixings may or may not be required, but if so would be fixed through the barge board face into the barge ladder with a non-corrosive fixing.

In an alternative embodiment the barge board and soffit may be omitted if they are still sound on an existing building. The profile in that case could terminate with the barge protection section.

Second or third additional lengths to complete a run are manufactured 1mm smaller than each other on 4 of the 6 faces (see Fig.4 - faces C and D require the same size on both lengths) which allows it to form a telescopic joint. The telescopic joint within the system allows the whole unit to be prefabricated to be adjustable fit correctly on the corners that the gable angle meets the front and back face of the building and when on site the telescopic movement of the system absorbs any variation in the shape of the construction of the building without having to trim to size. The telescopic lengths form an overlap when finally in place giving added strength at that point and if required a joint sealant could be added.

The invention extends the life of a building by providing an effective one-piece protective system against weather damage. The preferred material has a life expectancy of 40 years.

Further problems arise with the gutter systems on buildings. Most existing gutter and rainwater systems are currently manufactured in PVC, wood, or more recently uPVC. These system have many joints and fixings and a rubber grommet.

Figs. 8 and 9 illustrate how the invention can be put into effect. The new form of guttering is fixed along the roof line at its lowest horizontal edge. It is formed from a single metal sheet 40 which is bent or folded along longitudinal lines 41 which, except for one 42, extend parallel to one another and to the edge of sheet 40. Bend 42 creates two areas, a gutter part 43 and a mounting part 44, which taper respectively from left to right, and right to left. The angle of taper is about 1° to 5°.

When installed on a roof which has horizontal lines 45, the area 44 lies on the slope of the roof and the area 43 against the ends of the roof timbers. With line 42 positioned on a horizontal line 45, the gutter formed by the bends on lines 41 inevitably slopes down to the left by the same angle as the taper.

When the invention is fitted and fixed the first row of tiles are replaced on top and thus creating a natural clamp, further consolidated when fixing occurs through the gutter and fascia of the system into the exposed end of the roof trusses. This locating return leg sits on the wooden truss underneath the roof felt and tiles replacing the need for a conventional water guide membrane as water will fall directly into the gulley. The transverse width of area 44 could vary up or down

from 75mm.

If desired, a moulded or attached projection can be provided along or at one or more points in the area 44. The projection can serve as an abutment for the lowermost row of roof tiles. In addition, a downward lip (not illustrated) can be provided on the free edge of area 44, which can serve the same function as lip 26 in Fig.3, a groove then being provided across the roof timbers 46 to receive the lip. This would support the guttering.

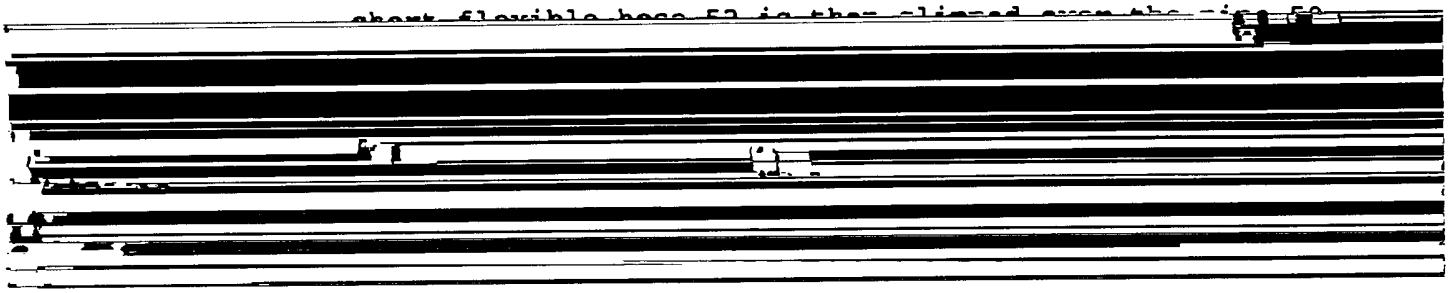
The rainwater system can be either fixed to the fascia profile in the factory or on site by suitable means such as spot weld or rivet. If a rainwater gulley is not required, then a fascia is fabricated with a similar area 44 to seat on the trusses under the felt and tiles as described above.

A lip 47 can be provided on the outside edge of the gutter to give increased strength, and variable thickness of the profile could give a specification able top carry a ladder weight. Facility for a leaf and debris protection, which could be a net or other form, is also possible.

Fig.10 illustrates a modified form of gutter which provides a much neater finish than is available from conventional gutter systems with a vertical water exit. In that case, the linkage between the water exit and the downpipe fixed to the wall has to be a cranked or S-connector, which is unsightly.

In Fig.10, the water exit 50 from the gutter 51 is substantially horizontal at the rear of the gutter. It is formed by a tubular pipe 50 which is integral with the gutter 51 or otherwise is attached e.g. by welding or adhesive in watertight fashion. In a preferred

form, the rear surface of the gutter can be cut and a flap folded down horizontally. A square section pipe 50 can be offered up to the resultant opening, with the flap within it adjacent its bottom surface. The pipe can then be fixed in position and sealed. A conventional square-to-round connector is then added. A short flexible hose 52 is then slipped over the pipe 50



and bent through approximately 90°, to be inserted into the open top of the drainpipe 53 fixed to the brickwork 54. In this case, also a sheet material unitary fascia 55 and soffit 56 are provided, and the flexible hose 52 is completely hidden within that. The method of mounting the gutter will now be described with reference to Fig.11.

Fig.11 shows in cross-section the mounting of the gutter 51, and the fascia 55 and soffit 56. A track member 58 in the form of an elongate profile member about 6M long is attached across the bottom ends 59 of the sloping rafters 60. The member 58 has two main portions and functions. A first portion has an inverted V shape 62 with a marginal section 63 which can be nailed or screwed onto the upper surfaces of rafters 60. This first portion provides an abutment surface 64. The second portion extends down in front of the ends 59 and abuts them along an inturned lip 65. The second portion thus caps the rafter ends 59 and provides a spacing function to keep the other components away from the ends. This both prevents corrosion of the fascia 55 and gutter 51 by preservative chemicals in the wood, and performs a levelling function across the cut ends of the rafters.

Each of the fascia 55 and gutter 51 have a lip portion 66, 67 which hooks over the first portion of the member 58 and engages the abutment surface 64. The suspended

(with the interposition of roof felt 69). The installation is thus extremely simple and requires initial fixing of only the track member 58. The gutter and fascia do not need to be pierced by fixings, which assists in preventing corrosion and discolouration.

Preferably each unit is custom fabricated to suit the individual needs and design of each building and all sizes and angles stated in the described examples can be carried out accordingly. It is also possible to provide stock sizes.

The invention incorporates along the base of the roof one-piece prefabricated replacement of standard components of fascia, soffit, rainwater system and membrane with integral ventilation. It utilises the construction and design of the roof line it is designed to protect, giving a rigid design that is easy to install by utilisation of the aforementioned telescopic extending lengths on each section for alignment prior to fixing.

The invention can further provide for an integral prefabricated ventilation system bringing buildings up to current building regulations with the added benefit of being hidden from view from the ground. The vent itself can be removable as required.

Although availability on fabrication depends on the width of bending machinery, spans of up to 6 metres can be manufactured on current machines and would be seamless. The majority of properties require a minimum of 5 metres and so the preferred lengths would be produced in approximately 3 metre lengths.

The invention has the added benefit of saving labour cost due to the dramatically reduced installation times.

The preferred material for all the profile members described is metal sheet with a protective coating. An example is quoted in relation to Figs. 2 and 3. The coating both protects the metal and provides a stable coloured finish.

CLAIMS

1. A profiled member adapted for sealing a roof gable and which is of integral generally U-section comprising two arms and a connecting member, wherein one arm forms a flashing designed to extend over the roof covering and be retained there, the connecting member forms a fascia to cover the vertical roof edge and the other arm returns under the edge to be fixed to the barge ladder or brickwork.

2. A profiled member as claimed in claim 1 wherein an L-section is formed integrally with the free edge of said other arm to form a bargeboard and soffit.

3. A profiled member as claimed in claim 1 or 2 wherein the free edge of said one arm has an inturned lip which can engage a groove in the roof covering which extends parallel to the roof edge.

4. A profiled member as claimed in any preceding claim wherein the one and/or the other arm form an angle less than 90° with the connecting member, whereby the member clamps resiliently over the roof gable end.

5. A profiled member as claimed in any preceding claim wherein the junction between said other arm and the connecting member is formed in such a way that an internal drainage channel is formed at the lower internal fascia edge to receive and channel any moisture which enters the U-profile when installed.

6. A profiled member as claimed in any preceding claim formed of a corrosion-resistant coated metal sheet.

7. A building having a roof gable end which is covered by a profile member as defined in any preceding claim.

8. A profile member which forms a roof-line gutter for a building, bent from a sheet material in which the slope or fall of the gutter is provided by bending a mounting part of said sheet material at a slight acute angle to a gutter part of said sheet.

9. A profile member as claimed in claim 8 wherein said acute angle is from 1° to 5°.

10. A profile member as claimed in claim 8 or 9 in which the said sheet material before bending has the form of an elongate strip, and the mounting part extends the full length of the gutter part.

11. A profile member as claimed in any of claims 8 to 10 wherein the free edge of the mounting part has a lip formation for engagement with retention means on the roof edge.

12. A profile member as claimed in claim 11 wherein the retention means is a longitudinally extending abutment surface formed in or attached to the roof surface beneath its covering.

13. A profile member as claimed in any of claims 8 to 12 having an outflow connector at one end which when mounted on a roof-line exists substantially horizontally from the rear of the gutter.

14. A profile member as claimed in any of claims 8 to 13 formed of a corrosion-resistant coated metal sheet.

15. A gutter channel for a building which has an outflow connector which when mounted on a roof-line exits substantially horizontally from the rear of the gutter.

16. A building having affixed thereto a gutter channel as claimed in claim 15, wherein a generally L-shaped connector pipe links the outflow connector to a vertically extending drainpipe attached to the outside surface of the building.

17. A profile member adapted to form retention means for a gutter along the lower edge of the sloping roof of a building, comprising a strip-like member having a cross-section in two parts, a first part which is to extend along the lower parts of the sloping rafters, forming an abutment rising above the plane of those rafters, and a second part integral with the first which forms a cap over the lowermost ends of said rafters and spaces a gutter from said ends.

18. A building having a profile member as claimed in claim 17 attached as defined, and a gutter suspended from said retention means by engagement of a lip formation of the gutter over the abutment.

19. A profile member substantially as herein described with reference to any of Figs. 2 to 6 and 8 to 11.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The Search report)	Application number GB 9519739.8
Relevant Technical Fields (i) UK Cl (Ed.N) E1D DDV DDS DPF (ii) Int Cl (Ed.6) E04D	Search Examiner J D CANTRELL Date of completion of Search 23 OCTOBER 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii)	Documents considered relevant following a search in respect of Claims :- 1-7

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Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2164369 A	(WILLIAM)	1, 2, 4, 5, 7
X	GB 1158911	(B P)	1,4, 5, 7

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